NORTH PACIFIC OCEAN, NOVEMBER 1937

By WILLIS E. HURD

Atmospheric pressure.—Atmospheric pressure over the extreme northern part of the ocean for November 1937 was low, with average center of the LOWS, east of the Peninsula of Alaska (Kodiak 29.62 inches). Owing to several days with high barometer readings over the central Aleutians, the average pressures at Dutch Harbor and St. Paul were 0.13 and 0.15 inch above the normal. At the stations given in table 1, the pressure extremes in the Aleutian LOW region were 30.58 on the 16th and 28.76 on the 9th, both at St. Paul. At Kodiak and Juneau the lowest readings occurred on the 22d and 24th. The lowest reported barometer of the month in the North Pacific area was 28.68, at Queen Charlotte Island on the 24th.

Owing to the prevalence of LOWS in high latitude and their considerable southward extension, high pressure this month is shown as an anticyclonic band stretching from the California coast across the Hawaiian Islands and thence westward to the east China coast. Along this belt, Midway Island, with an average of 30.00, had a departure of −.08; while Naha, in the Nansei Islands, with an average of 30.02, had a departure of +.12, thus indicating the unusual strength of the Asiatic anticyclone in east China waters.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean, November 1937, at selected stations*

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Point Barrow	29.95	−0.05	30.66	20	29.24	10
Dutch Harbor	29.72	+.13	30.34	15, 16	29.06	9
St. Paul	29.74	+.15	30.58	16	28.76	9
Kokiak	29.62	+.06	30.12	13, 14	28.94	22
Juneau	29.78	+.02	30.20	9	28.90	24
Tatoosh Island	29.88	−.09	30.38	3	29.40	8
San Francisco	30.07	−.02	30.26	25	29.82	11
Mazatlan	29.91	+.02	29.96	{18, 19, 22}	29.82	16
Honolulu	30.04	+.02	30.14	7	29.87	16
Midway Island	30.00	−.08	30.18	25	29.66	17
Guam	29.85	−.01	29.89	2, 24	29.74	30
Manila	29.83	.00	29.93	29	29.56	17
Hong Kong	30.00	−.04	30.18	24, 25	29.76	18
Naha	30.02	+.12	30.18	24	29.80	18
Titijima	30.00	+.02	30.15	24, 26	29.62	18

NOTE.—Data based on 1 daily observation only, except those for Juneau, Tatoosh Island, San Francisco, and Honolulu, which are based on 2 observations. Departures are computed from best available normals related to time of observation.

Extratropical cyclones and gales.—Notwithstanding the advance in the season, the North Pacific cyclones of November were much shallower as a rule than those of the preceding month, and on only a few days did their central pressures fall below 29 inches. Except in middle latitudes of the ocean there was little or no increase in storminess over that of October. The weather was only moderately severe along the higher and middle steamship routes, and only 8 days were reported with gales of force as high as 10. The highest wind reported by a vessel was of force 12, encountered on the 7th by the British motorship *Tweedbank* a short distance southwest of Midway Island. The accompanying lowest pressure was 29.82.

November 1 and 2 were stormy days in both northwestern and northeastern waters. A cyclone east of northern Japan caused gales of force 8 to 10 over the northern route to the southeastward of the Kuril Islands on both dates, then moved northward over Kamchatka and thence eastward into the Bering Sea. In the northeastern sector storminess was equally heavy, but more widespread, with gales of force 8 to 10 reported from nearly all parts of the region within latitudes 40° and 50° N., longitudes 125° and 150° W. Lowest pressures there were about 29.20 inches.

During the period of the 5th to 12th stormy weather occurred north and northwest of Midway Island, between latitudes 30° and 40° N., in addition to the hurricane winds already mentioned as encountered southwest of Midway on the 7th. Most of the high winds were of force 8–9, but force 10 gales occurred on the 11–12th near 38° N., 166° E.

From the 8th to the 25th cyclonic weather overspread much of the northern part of the ocean, with scattered developments of LOW centers which were accompanied, along the western half of the northern routes, particularly on the 18th to 24th, by fresh to whole gales. Over the eastern half of the routes gales were fewer and less severe. However, the Weather Bureau station at North Head, Wash., had maximum wind velocities of 49 miles an hour from the south on the 13th, 22d, and 23d, and a 72-mile wind (force 11) on the 24th.

Typhoons.—Two disastrous typhoons crossed the Philippine Islands in November, one during the 11th, the other during the 17th. Both caused considerable loss to life and property. The history of these storms is given in the subjoined report prepared by the Rev. Bernard F. Doucette, S. J., of the Philippine Weather Bureau.

Tehuantepecers.—In the Mexican Gulf of Tehuantepec, norther-type gales of force 8 were reported on the 1st and 25th, and of force 9 on the 24th. During the Tehuantepecers of the 24th, the U. S. S. *Neches* reported a considerable drop in the air and water temperatures. The British motorship *Adellen*, in describing the weather features that day in the Gulf, spoke of a "slight haze and a hard bright glare on the horizon," with a cloudless sky except for a fan-shaped formation of cirrocumulus radiating from a northerly point at noon.

Fog.—Fog was observed on the 2d near 45° N., 160° E., and on the 5th to 8th and the 27th along the 40th parallel between 180° and 160° W. It occurred in California coastal waters on 7 days; west of Lower California on 2 days; and in the Gulf of Tehuantepec on 2 days.

TYPHOONS AND DEPRESSIONS OVER THE FAR EAST, OCTOBER 1937

Rev. BERNARD F. DOUCETTE, S. J.

[Weather Bureau, Manila, P. I.]

Typhoon, September 30–October 6, 1937.—Over the Pacific, about 350 miles east of Samar, a depression formed during the forenoon hours of September 30 and then moved northwest from this position. Two days later, it inclined to the west-northwest and crossed the Balintang Channel. On October 2 it intensified as it approached Calayan, passing close to and south of this station. The course of this storm hardly changed as it moved across the northern part of the China Sea up to the locality of Pratas Island, where it inclined to the north-northwest (October 4). The morning of October 5 the typhoon was entering the continent between Hong Kong and Swatow, disappearing the next day.

At Calayan, October 2, at 5 p. m., the minimum pressure was recorded, namely 737.95 mm (29.053 inches, corrected for gravity). North-northeast winds of force 7 were blowing at the time. The strongest wind experienced at that station during the course of the storm was force 10, from the east, at 9 p. m. of the same day.

On October 4, the two ships, *President Wilson* and *President Jefferson*, had severe typhoon weather as both

ships delayed their progress toward Hong Kong, being within 150 miles distance from the typhoon center. The S. S. *President Wilson* experienced west-southwesterly winds force 8 and a sea from the same direction, with a northerly swell, as she slowly proceeded from Manila to Hong Kong. A value of 29.54 inches for the pressure was reported. The S. S. *President Jefferson*, on the opposite side of the typhoon center, proceeding from northern Chinese ports to Hong Kong, had pressures around 29.64 inches with easterly winds, force 10 to 8.

No notice of serious damage in the Philippines due to this typhoon has come to the attention of the Observatory staff.

Typhoon October 9–20, 1937.—On October 9 there was a trough of low pressure extending from the Philippines to the Mariana Islands. Over the eastern portion, a depression appeared about 180 miles north of Yap and moved west by north to the 130th meridian, where it intensified sufficiently to be called a typhoon. Its further course was such that central and northern Luzon were threatened, for during October 12 to 14 it had inclined to the west-north west. Observations during the night of October 14 and early morning hours of the 15th from Tuguegarao and Echague indicated that the storm had decreased in intensity and was crossing the island, but the more complete synoptic observations of October 15 showed that the typhoon was still over the Pacific, located about 120 miles east of northern Luzon and, fortunately, during the day, inclining northward. When the typhoon had reached the eastern part of the Bashi Channel its course changed to the northeast, and when about 120 miles southeast of Naha it shifted to the east (October 17). A northeasterly direction was again followed, the change occurring during the afternoon of October 18, the storm passing about 150 miles northwest of the Bonins on its way beyond the region of observation.

The S. S. *President Hoover* passed west of this typhoon center when it was located southeast of the Nansei (Loochoo) Islands. Of the observations sent to the Observatory, the following best represents the force and energy of this severe storm. At 0400 G. C. T. (noon, 120th meridian time) October 17, the weather experienced at latitude 23.9 N. 127.7 E. was "torrential rain, high seas, and heavy swell, N.–12, barometer 29.07 in."

Newspapers of October 15 had reports of three deaths and considerable property damage over Luzon due to the typhoon weather. Over the Visayan Islands heavy rains were associated with a strong persistent southwesterly current.

Typhoon, October 10–12, 1937.—Over the western part of the trough of low pressure mentioned at the beginning of the preceding typhoon report, a depression appeared about 150 miles east of central Samar, moved west-northwest to southern Luzon, became stationary, and disappeared over Lagonoy Gulf. This storm had the characteristics of being a secondary disturbance, the primary being the typhoon of October 9–20. There was definite circulation around a center, with low barometers, but weak winds. At the same time, the southwesterly winds over the Visayan Islands were increasing in strength, until there was no more evidence of circulation over Lagonoy Gulf, this happening as the primary disturbance intensified. Because of the low values of the barometers (lower than 750 mm, 29.528 inches) this disturbance is classified as a typhoon.

Typhoon October 19–21, 1937.—The observations from the S. S. *Swartenhoudt* on the afternoon of October 19 showed the presence of a small active center about 180 miles east of Quinhon, Indo China. This typhoon moved a short distance west-northwest and then inclined somewhat to the west-by-south, bringing it to the coast between Quinhon and Nhatrang. On the 21st, only slight traces of its existence were evident. The M. S. *Bengalen* passed about 200 miles south of the storm and reported a high choppy northerly swell.

The S. S. *Swartenhoudt* reported October 19, 5 p. m. (120th meridian time), from latitude 12.30 N., longitude 112.20 E. a barometer of 752 mm (29.606 inches) west winds, force 12, heavy rain, very high confused swell.

Depression, October 15–25, 1937.—A low pressure area formed about 300 miles south of Guam, moved in a northwesterly direction, then west-northwesterly to the regions near latitude 16 N., longitude 132 E., where it recurved to the northeast and disappeared. It gave no evidence of being intense.

TYPHOONS AND DEPRESSIONS OVER THE FAR EAST, NOVEMBER 1937

Rev. BERNARD F. DOUCETTE, S. J.

[Weather Bureau, Manila, P. I.]

Typhoon, November 8–13, 1937.—An extensive low pressure area over the western Caroline Islands finally, on November 8, manifested a definite center which moved in a northwesterly direction from a position about 120 miles west of Yap. On November 10 this disturbance was located about 300 miles east of San Bernardino Strait. During the forenoon, it moved a short distance to the northwest, but changed to a west-by-north course when it reached the 14th parallel of latitude, intensifying as it proceeded. At 6 a. m. November 11 it was central about 50 miles northeast of the Camarines Provinces, continuing its west-by-north motion. It crossed Pollilo Island, then passed close to and north of Infanta, Tayabas Province, likewise Manila, after which it deflected its course slightly to west-by-south, thus passing close to and south of Olongapo, Zambales Province. In the China Sea, November 12, it continued, it is supposed, this west-by-south course, inclining to the west-southwest and perhaps southwest as it approached Indo China. The morning of November 14 showed that it had practically disappeared a short distance inland, after passing between Quinhon and Nhatrang.

Barometric minima [1] along the course of the typhoon are as follows: Infanta, Tayabas, had a value of 721.14 mm (28.392 inches) at 2:40 p. m., November 11, as the typhoon center passed close to and north of the station. Hurricane winds prevailed as the typhoon passed with northwest winds backing to south. North of Manila, as the typhoon center passed between 4 and 5 p. m., values close to 740 mm (29.134 inches) were observed on recently compared aneroid barometers in private houses, thus giving dependable values. At the observatory, south of the typhoon path, the minimum of 745.40 mm (29.346 inches) was recorded at 4:35 p. m. The Friez anemometer ceased recording soon after 4 p. m. From a Beckley anemograph, the 1-hour average (the highest during the afternoon) between 4 and 5 p. m., was 64 m. p. h., from the southwest. There were many gusts of greater velocity, estimated close to 80 m. p. h. during the period from 4 to 5:30 p. m. The passage of the storm over the hilly country between Infanta and Manila had weakened the typhoon very much. In the China Sea, it did not exert its influence to any great extent and only the observation received from the S. S. *Hong Kheng*, November 13, 6 a. m., in latitude 14°12′ N., longitude 110°36′ E., indicated the existence of the disturbance approaching Indo China;

[1] Values of barometric minima are corrected for gravity.